

REMARKS

Claims 30-33, 36-38 and 40-52 are currently pending in the present application. Favorable consideration and allowance of these claims are respectfully requested.

In view of the finality of the recent Office Action and the claim amendments contained herein, a Request for Continued Examination is being filed concurrently with this Amendment.

The rejections of claims 30-33, 38-41, 47, 49, 51 and 52 under 35 U.S.C. § 102(b) over Tomita et al. (JP 2001-214270); of claims 30-33, 36, 40, 41, 43-47 and 51 under 35 U.S.C. § 103(a) over Ono (JP 47-10730) in view of Tokai et al. (2002/0014700 A1); of claims 38, 39 and 52 under 35 U.S.C. § 103(a) over Ono (JP 47-10730) and Tokai et al. (2002/0014700 A1) and further in view of Tomita et al. (JP 2001-214270); of claim 37 under 35 U.S.C. § 103(a) over Ono (JP 47-10730) and Tokai et al. (2002/0014700 A1) and further in view of Ueda et al. (5,365,772); of claim 36 under 35 U.S.C. § 103(a) over Tomita et al. (JP 2001-214270) in view of Ono (JP 47-10730); of claims 42 and 49 under 35 U.S.C. § 103(a) over Ono (JP 47-10730) and Tokai et al. (2002/0014700 A1) and further in view of Satake et al. (JP 2001-234348); of claims 49 and 50 under 35 U.S.C. § 103(a) over Ono (JP 47-10730) and Tokai et al. (2002/0014700 A1) and further in view of Holst et al. (2003/0056726); of claim 48 under 35 U.S.C. § 103(a) over Ono (JP 47-10730) and Tokai et al. (2002/0014700 A1) and further in view of O'Neill et al. (JP 07-188932); of claim 37 under 35 U.S.C. § 103(a) over Tomita et al. (JP 2001-214270) in view of Ueda et al. (5,365,772); of claims 42 and 49 under 35 U.S.C. § 103(a) over Tomita et al. (JP 2001-214270) in view of Satake et al. (JP 2001-234348); of claims 49 and 50 under 35 U.S.C. § 103(a) over Tomita et al. (JP 2001-214270) in view of Holst et al. (2003/0056726 A1); of claims 43-46 under 35 U.S.C. § 103(a) over Tomita et al. (JP 2001-214270) in view of Tokai et al. (2002/0014700 A1); of claim 48 under 35 U.S.C. § 103(a) over Tomita et al. (JP 2001-214270) in view of O'Neill et al. (JP 07-188932) are all respectfully traversed.

As set forth in amended claims 30 and 51, the present invention provides a film forming apparatus having the feature that a bypass line is connected to the source gas line at a node, and the gas analyzer is provided in a path of the source gas flowing from the source bottle to the node, such that the source gas flowing from the source bottle to the node flows through the gas analyzer. Support for this amendment may be found in the specification as originally filed, for instance, at least on page 29, line 31 to page 30, line 21. Claim 38 is amended to conform to the changes made in claim 30.

With this feature, it becomes possible to measure both the source gas concentration introduced into the processing vessel and the source gas concentration in the pre-flow line 33 with the ETIR 40, and the present embodiment can control not only the source gas concentration before the commencement of the film-formation process but also the source gas concentration actually used during the film-formation process. In other words, the present embodiment enables monitoring of the source gas concentration of the mixed gas actually in use for the film formation process and immediate correction of any deviation of the source gas concentration beyond the predetermined concentration range. As the mixed gas used for the actual film-formation process has the source gas concentration already adjusted during the period in which the mixed gas is caused to flow through the pre-flow line, there can be no large deviation in the source gas concentration when the mixed gas is switched and introduced into the processing vessel 100.

Thus, the need for a large change of the source gas concentration during the film-formation process by significantly increasing or decreasing the diluting gas is avoided, and a stable film formation becomes possible.

Neither of Ono or Tokai et al teach or suggest the feature of a bypass line and the feature of providing the gas analyzer between the source bottle and the node where the bypass line is connected to the source gas line as set forth in amended claims 30 and 51, for enabling measurement of both the source gas

concentration introduced into the processing vessel and the source gas concentration in the bypass line.

Further, while Tomita et al discloses a gas analyzer 46 provided so as to sample the source gas in the source gas line, Tomita fails to teach the feature of the present invention of “said gas analyzer is provided in a path of said source gas flowing from said source bottle to said node, such that said source gas flowing from said source bottle to said node flows through said gas analyzer.”

Thus, while Tomita et al is capable of adjusting the concentration of the source gas at the beginning of film formation by sampling the source gas, it is not possible, with Tomita et al, to monitor the concentration of the source gas actually supplied to the processing once the film formation process is started. In particular, if valve 45 is opened, gas will flow to the gas analyzer 46, however there is no provision for the gas to return to supply way 2, so as to reach the reaction chamber 1. In contrast to the teachings of Tomita et al, it is possible, with the present invention, to monitor the concentration of the source gas not only before starting actual film formation by analyzing the source gas to be discarded to the bypass line but also after the start of the actual film formation by analyzing the source gas supplied to the processing vessel.

None of the other cited references disclose this feature of the presently claimed invention. Accordingly, the claims are believed to be distinguishable from the cited references and reconsideration and withdrawal of these rejections are respectfully requested.

Conclusion

In view of the foregoing, the application is respectfully submitted to be in condition for allowance, and prompt favorable action thereon is earnestly solicited.

If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket No. 010986.52578US).

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